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Author(s)	Byrne, Dara; O'Connor, Paul; Lydon, Sinéad; Kerin, Michael J.
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# Preparing New Doctors for Clinical Practice: An Evaluation of Pre-Internship Training

*Dara Byrne, P O'Connor, Sinead Lydon, MJ Kerin*

D Byrne<sup>1</sup>, P O'Connor<sup>2</sup>, S Lydon<sup>3</sup>, MJ Kerin<sup>1</sup>

<sup>1</sup>Department of Surgery, Galway University Hospitals, Newcastle Road, Galway

<sup>2</sup>JE Cairnes School of Business Economics and <sup>3</sup>Psychology Department, NUI, Galway

## Abstract

A consistent finding in the literature is that newly graduated medical students often do not possess the basic skills required to perform their job. Training designed to prepare newly graduated medical students for internship was developed and delivered to 106 newly graduated medical students. Feedback on the course was obtained using anonymous pre- and post-course questionnaires. A total of 32 students (52.5% of the pre-course respondents) felt that they were prepared prior to the training, compared with 51 students (79.7% of the post-course respondents) who felt prepared for internship after the training. The largest effect size of the training was for the administration of medication (Cohen's  $d = 0.93$ ). Further development to the training programme is required. Nevertheless, it is suggested that this course could serve as a model to address the unsatisfactory levels of preparedness for the work of a junior doctor reported by medical students from many countries.

## Introduction

Traditionally in Ireland, newly graduated medical students received no specific internship training prior to starting their intern year beyond what they learned as undergraduate medical students. Two studies have identified deficiencies in the practical skills training provided during undergraduate medical education in Ireland. In a survey of 84 recently graduated Irish medical students, over 90% reported they did not possess all the skills they believed they would need during their intern year<sup>1</sup>. Similarly, in a survey of 300 interns from across Ireland conducted five years later, only 15% thought their procedural skills were adequate on leaving medical school<sup>2</sup>. Recognising the need to better prepare interns, the Irish Medical Council set-up a network of intern coordinators and intern tutors to provide additional training and education. As part of this process, the intern coordinator of the Western region developed a training programme called 'shadowing for clinical practice' for delivery between graduation from medical school and prior to the commencement of the intern year. The goal of the training programme was to prepare newly graduated medical students for the internship year by providing them with the knowledge and skills required to perform the job of an intern on a hospital ward. The content of the training was based upon a literature review, a survey of interns, the requirements of the National Intern Training Programme (NITP) curriculum, and the eight domains of good professional practice identified by the Medical Council of Ireland<sup>3</sup>.

## Methods

The training programme was delivered over four weeks by a multi-disciplinary team of specialists. There were two components to the training: clinical/technical skills development, and shadowing. The nine modules that made up this component of the training were: infection control and policy; haemovigilance and oxygen; communication and professional development; phlebotomy and cannulation; catheterisation; clinical note taking; admissions, and discharges; medicines and prescribing; radiology; technical procedures (rectal, prostate,

scrotal and breast exam); and performing an electrocardiogram (ECG). The students received a total of 14.25 hours of classroom lectures, 13.5 hours of demonstrations, and 24.25 hours of workshop teaching.

In addition to the formal training modules, the course participants also spent four days shadowing experienced interns in a number of different medical teams during which time they had to complete a prescribed set of tasks that were recorded in a log book. The purpose was to give the students an increased understanding of the tasks and role they would be expected to perform as an intern. The logbooks were signed off by the supervising team and reviewed by the intern coordinator. To complete the shadowing for clinical practice programme, the students were also provided with career advice, stress management training, personal health advice, and were given advice on internship and career structure from outgoing interns, non-consultant hospital doctors, and consultants. The purpose of the study reported in this paper was to carry out an evaluation of the effectiveness of the training and examine whether newly graduated medical students felt better prepared for their intern year as a result of receiving a course specifically designed to prepare them for internship. Two separate training evaluations were carried out. In the module evaluation form the students indicated whether or not they had previous knowledge of the skills and procedures and the medical theory addressed in each of the nine modules and how the knowledge and skills were previously obtained. For each module students were asked to report whether they had found it helpful, how prepared they felt in that area prior to the training, and how prepared they felt after the training. Students were also able to comment on the perceived strengths and weaknesses of each module.

In the preparedness for internship questionnaire a pre-training evaluation was completed the first day of the training. The students were asked to rate their preparedness for internship in terms of: knowledge; clinical or technical skills; decision making ability; following hospital protocols and procedures; administering medication; managing an emergency; communicating with patients; communicating with senior doctors; communicating with nursing staff; and their overall readiness. Unlike the module evaluation form, this was designed to be general, rather than specifically relating to the training course. The participants responded on a five point Likert scale ranging from 'definitely prepared', to 'definitely not prepared'. Of the 106 students who attended the training, 100 students completed and returned the module evaluation forms. A total of 61 students completed the preparedness for internship prior to the training, and 64 students completed it after training. All of the students achieved a pass grade at Direct Observation of Procedural Skills (DOPS) examination of their clinical/technical skills and procedures/protocols. All of them completed their shadowing tasks to a satisfactory level as recorded in the logbooks and all achieved certification in basic life support.

The module evaluation form was included within the introductory material provided at the beginning of the training course. Students were encouraged to complete the module evaluation form immediately after they received each module of training. The preparedness for internship questionnaire was distributed to the students on the first and last days of the training course.

<b>Skills N=100</b>	<b>No prior knowledge</b>	<b>Observed/ theoretical knowledge</b>	<b>Performed</b>
Oxygen administration	23	67	10
Venepuncture	5	56	39
Cannulation	12	47	41
Arterial blood gases sampling	30	51	19
Catheterisation	17	54	29
Performing an ECG	14	40	45
Priming a line	77	16	7
Dose calculations	74	15	11
Breast exam	0	61	39
Rectal exam	0	61	39
NGT insertion	3	68	29
Handwashing	2	24	73
Sterile glove application	2	21	76
Blood cultures	67	22	9
Setting up a sterile field	21	32	46

## Results

Table 1 summarises the students' prior knowledge and experience of specific clinical/technical skills and Table 2 summarises the students' prior knowledge of hospital protocols/procedures. Table 3 summarises the feedback from the respondents on their level of preparedness in terms of the knowledge, skills and procedures addressed in each module, and the number that thought the module was useful. A total of 100 responses were collected, therefore the numbers of responses presented in Tables 1 to 3 are the equivalent of percentages. A common theme identified from the comments to the open-ended questions was that there were too many didactic lectures with students providing responses such as "information in the lectures is maybe a waste of time at this stage" and "lectures completely unnecessary". It was suggested that more opportunities to practice the procedures would be far more beneficial with students writing that "more practice and individual feedback" and "smaller groups and more chances to practice" would increase the value of the training. It was also proposed that the course should focus on providing students with more individual feedback, advice, and checklists for each procedure.

<b>Table 2 Respondents' of the self-reported experience of specific protocol/ procedure experience during medical school (total of 100 respondents).</b>			
<b>Skills (n=100)</b>	<b>No prior knowledge</b>	<b>Observed/ theoretical knowledge</b>	<b>Performed</b>
Completing an in-patient prescription sheet	55	35	10
Writing a prescription	54	45	1
Completing a death cert/pronouncing death	55	45	0
Haemovigilance – ordering from blood bank	77	21	2
Prescribing blood products	76	17	7
Using the computerised x-ray system	37	46	17
Using the computerised patient system (HIPE) and discharge system (EDS)	81	16	3
Clinical note taking/SOAP	43	47	10

<b>Table 3 Number of respondents (out of a total of 100) who felt prepared pre- and post-training, and who thought the module was helpful</b>			
<b>Module</b>	<b>Number who felt prepared prior to training</b>	<b>Number who felt better prepared after training</b>	<b>Number who found the module helpful</b>
Infection control and policy	58	92	90
Haemovigilance and oxygen	43	95	95
Communication and professional development	53	83	85
Phlebotomy and cannulation	56	96	97
Catheterisation	54	94	90
Clinical note taking: Admissions and discharges	48	92	91
Medicines and prescribing	43	96	97
Radiology	46	76	80
Clinical procedures and performing an ECG	70	91	85

Cohen's d was used to evaluate the size of the difference in the pre- and post-training self-reported preparedness for internship. Cohen's d describes the standardised difference between two group means. In this study, the mean difference was based upon the mean rating of preparedness on a five point scale pre- and post-training. A Cohen's d of 0.2 or less can be considered to be a small effect, 0.5 a medium effect, and 0.8 or greater a large effect. The percentage and number of participants reporting that they were either probably or definitely prepared for internship, and the effect sizes as measured by Cohen's d are provided in Table 4.

Table 4 Summary of levels of preparedness reported before and after training, and the effect sizes of the difference (61 responses pre-training, 64 responses post-training)			
Preparation for internship categories	Number definitely or probably prepared (% in brackets)		Effect size (Cohen's d)
	Pre-training	Post-training	
Knowledge	51(83.6)	25(81.3)	0
Clinical or technical skills	25(41.7)	49(81.3)	0.75
Decision making ability	19(31.1)	34(53.1)	0.46
Following hospital protocols and procedures*	23(38.3)	41(64.1)	0.71
Administering medication	18(29.5)	41(64.1)	0.93
Managing an emergency	7(11.5)	23(35.9)	0.79
Communicating with patients	59(96.7)	62(96.9)	0.28
Communicating with senior doctors	51(83.6)	59(92.2)	0.45
Communicating with nursing staff*	45(75.0)	57(89.1)	0.47
Overall readiness	32(52.5)	51(79.7)	0.54

\* 60 responses in the pre-training survey for this item.

## Discussion

It has been consistently reported that high percentages of newly graduated medical students report feeling under-prepared to begin working in a hospital<sup>1,5,6</sup>. The aim of the study reported in this paper was to examine the effects of a training programme designed to improve their preparedness for internship. It can be seen from Tables 1 and 2 that there was considerable variation in the level of prior knowledge and experience of different clinical/technical skills and hospital protocols/ procedures obtained during undergraduate medical school. Moreover, the finding that such a low percentage of students had actually completed many of the skills and procedures that they would be expected to carry out on the first day of internship emphasises the importance of the shadowing for clinical practice program. It is recommended that additional training in these skills and procedures should be incorporated into the undergraduate medical curriculum with students required to achieve a designated level of experience before graduation.

Tables 3 and 4 showed that the training had a positive effect on the level of preparedness reported by the students. For four of the domains identified in Table 4 there were small effects of training, four had medium effects of training and one had a large effect of training (prescribing and administration of medication). This finding is also reflected in the module evaluations with participants reporting the prescribing and administration of medication module to have been one of the most helpful (see Table 3). The fact that the course participants were more confident in their ability to prescribe and administer medicine is a very positive finding given the high rate of human errors associated with this task, and the fact that prescribing has been identified as a source of stress for junior doctors<sup>7,8</sup>.

Despite the positive response to the training, a consist theme from the open-ended comments regarding the strengths and weakness of the modules was the need to reduce the numbers of lectures, and increase the opportunities to practice the skills and procedures addressed in the

training. The students did not believe that the training impacted their knowledge (see Table 4), and consistent with other research, the limitations of their practical and procedural skills was considered to be far greater than any deficit in theoretical knowledge<sup>6,9</sup>. In addition to the desire for more practical training and less lectures, the feedback from the participants suggested that there are other areas in which they require further training. The percentage of the students reporting that they felt prepared for internship was lower than would have been desirable for decision making ability and managing an emergency (see Table 4). It is suggested that the incorporation of more problem-focused and scenario-based training in both medical school, and as part of internship training, would be beneficial in providing a more structured method for allowing practice in decision making and emergency management.

Overall, the shadowing for clinical practice programme was a necessary, and well received, practically focused training course that improved the level of self-reported preparedness for medical students transitioning to internship. It is acknowledged that further development to the training programme is required, and there is a need to supplement the self-report data with more objective measures of effectiveness using a prospective research design (e.g. an evaluation of their ability to perform specific skills and procedures before and after training). Nevertheless, given the dearth of reports of this type of training in the literature, it is suggested that the 'shadowing for clinical practice' training course could serve as a useful model for improving the preparedness of newly graduated medical students in other countries.

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Correspondence: P O'Connor

Centre for Innovation and Structural Change, J.E. Cairnes School of Business Economics, NUI, Galway

Email: [paul.oconnor@nuigalway.ie](mailto:paul.oconnor@nuigalway.ie)

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